

In re the application of: **HAYASHI, Noriya**
Serial Number: **09/664,332**
Reply Brief in response to Examiner's Answer of December 21, 2005

ARGUMENTS

Appellant maintains the arguments presented in the Appeal Brief on November 22, 2005, and here comments on the sections of the Examiner's answer and responds to the arguments presented in the Examiner's answer.

Regarding Sections (1) to (8) of the Examiner's answer

The Examiner confirms that sections (1) to (8) of the Appeal brief were correct.

Regarding Section (9) of the Examiner's answer

The Examiner presents a summary of the one ground of rejection that is at issue. Appellant respectfully notes that the wording in this section of the Examiner's answer is not the same as that of the original presentation of the rejection on July 24, 2003, and of the subsequent statements of the rejection.

In this regard, on page 7, second paragraph, the Examiner discusses the "makes it possible to cure by chain reaction" phrase in the claims, stating that this is not an affirmative limitation, and also presenting arguments addressing the case in which the limitation is given weight. Appellant notes that Appellant has **not** argued that this phrase is, in itself, a claim limitation, although this phrase is discussed with regard to the "unexpected effects" of the claimed composition.

Regarding Section (10) of the Examiner's Answer

On pages 9-10 of the Examiner's answer, the Examiner repeats his main argument, which is

In re the application of: **HAYASHI, Noriya**
Serial Number: **09/664,332**
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based on Starkey's Examples 2, 3 and 5. On page 10, the Examiner explains why his argument does not represent "picking and choosing", in response to Appellant's argument on page 20, line 5 from bottom, of the Appeal Brief. The Examiner states:

"The particular epoxy resin and thermohardening catalyst was selected in consideration of those most pertinent to the claims which are the elected species of 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexanecarboxylate repeatedly shown in Starkey and maleic anhydride curing agent. Furthermore, the elected species of epoxy resin is exhibited in Examples 2, 3 and 5."

In response, Appellant first notes that which species was **elected** in response to the election requirement of December 28, 2001, is **not relevant** to Appellant's arguments, and the election does not properly provide a basis for this rejection. That is, the fact that Appellant has elected these species does not provide a proper rationale for the Examiner's picking and choosing the particular combination of these two species from among the many possible resins and curing agents disclosed in the prior art. This is hindsight based on the election.

Appellant also notes that the Examiner appears to concede that **Starkey's cited Examples do not use maleic anhydride**, this fact being the basis of Appellant's argument in section A(1)(a), on page 18 of the Appeal Brief. Appellant respectfully notes that the Examiner appears to have avoided rebutting this portion of Appellant's argument, which noted that, in fact, Starkey's Examples 2 and 5 **do not use any thermohardening catalyst**. Yet the Examiner concludes at the bottom of page 10:

"It is clearly within the confines of Starkey to add the thermohardening catalysts at a quantity of 10 phr and to use the elected species of maleic anhydride."

Appellant submits that this statement, with the phrase "within the confines," **does not**

In re the application of: **HAYASHI, Noriya**
Serial Number: **09/664,332**
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address the key issue of whether there is any suggestion or motivation in Starkey for the claim limitations, and does not rebut Appellant's argument. Appellant again argues that there is no suggestion in the cited Examples for the **combination of claim limitations in the last two clauses** of independent claim 1, claim 27 or claim 28.

On page 11, first paragraph, the Examiner discusses Buchwalter et al. with regard to the curing agent to photopolymerizable resin limitation (second-to-last clause of claim 1). The Examiner states: "Buchwalter et al. sets forth a calculated molar ratio of 0.93 :1 embraced by the claimed limits of from 0.3:1 to 1.4:1." This refers to Example 1 of Buchwalter, which Appellant discussed in section A(2) of the Appeal brief, at the bottom of page 21. Here, Appellant noted that although Buchwalter's Example 1 meets the limitation of the second-to-last clause of claim 1, it does **not meet the limitation of the last clause** of claim 1. Appellant argues that the present claims clearly require that **both limitations be met**, and there is no suggestion in the reference for both claim limitations.

On page 11, the Examiner goes on to discuss combinations of Starkey, Buchwalter, Hamazu and Green. However, as noted, the sole suggestion in these references for the second-to-last clause of claim 1 appears to be the value in one particular example (Example 1) of Buchwalter et al. The Examiner has not clearly stated how the references can be combined to provide a suggestion for the **simultaneous meeting** of the limitations of both the second-to-last clause and the last clause of claim 1.

At the bottom of page 12, to page 13, the Examiner states:

"The consideration of Buchwalter et al. as a whole establishes a molar ratio of acid

In re the application of: **HAYASHI, Noriya**
Serial Number: **09/664,332**
Reply Brief in response to Examiner's Answer of December 21, 2005

anhydride curing agent of 0.93:1 since it is the only amount disclosed therein, along with a proportion of photopolymerization initiator of from about 0.5% to about 10% by weight.

Buchwalter et al. meets both limitations of the molar proportion of curing agent:photopolymerizable resin and amount of photopolymerization initiator considering the exemplified molar proportion of 0.93:1 and the disclosed content of photopolymerization initiator of from about 0.5% to about 10% by weight, respectively.”

However, Appellant submits that the Examiner's statement that “it is the only amount disclosed therein” is **not correct**. First of all, Example 1 is one of two Examples in Buchwalter et al., with Example 2 having **no anhydride curing agent at all** (i.e., ratio of zero). Secondly, as discussed in the Appeal Brief, Example 1 of Buchwalter et al. uses 0.54 parts photoinitiator to 1.8 parts resin and 0.91 parts anhydride (with only small amounts of other components), that is, 0.54 to (1.8 + 0.91), corresponding to about **20** parts per 100, **well outside** the range in the present claims. That is, the Example cited by the Examiner as the only disclosure of the curing agent:resin limitation of the second-to-last clause of claim 1, cannot be readily combined with any suggestion for the last clause of claim 1.

On page 12, the Examiner discusses the fact that the references use weight ratios while the present claims use mole ratios. In this regard, Appellant respectfully disagrees with the Examiner's statement that:

“It has been unequivocally established on the record that Starkey discloses a molar ratio of 0.32:1 and Buchwalter et al. exhibits one of 0.93:1.”

Although this is true for Buchwalter's Example 1, it is **not true for Starkey**. Appellant has pointed out how the Examiner derived the molar ratio of 0.32 in Starkey **only by picking and choosing** 1) a

In re the application of: **HAYASHI, Noriya**
Serial Number: **09/664,332**
Reply Brief in response to Examiner's Answer of December 21, 2005

particular resin, 2) a particular curing agent, and 3) the upper limit of a disclosed weight ratio range.

The resin and curing agent were clearly picked for their high and low molecular weights, respectively.

The recited molar ratio is clearly **not** met in any of Starkey's examples, many of which have **no curing agent at all**. There is no "disclosure" in Starkey of this limitation.

On page 13, second paragraph, the Examiner addresses Appellant's arguments based on the 1.132 declarations. These arguments are presented in section B of the Appeal brief, starting on page 22. On page 14, the Examiner concludes that:

"The evidence is not commensurate in scope with the claims with respect to a representative sampling of the claimed proportion range of [from] 0.1 to 6.0 parts by weight per 100 parts by weight of the whole weight of the other components. The testing of levels at the lower limit of the range does not confirm the criticality of the upper limit of 6.0 parts by weight, especially considering the revelation in Starkey that at a quantity exceeding 4 parts by weight, the problems of the precipitation of crystals or insufficient hardening of the lower part occurs when [utilizing] a photopolymerization initiator such as an aromatic sulfonium halogen-containing complex ion salt (col. 12, lines 35-36 and col. 13, lines 17-21)."

Appellant submits that **this appears to be a new argument** on the part of the Examiner, in particular the reference to Starkey. Starkey at column 12, lines 35-36, only discloses preferred photoinitiators. Column 13, lines 17-21, states that when the photoinitiator "exceeds about 4 parts by weight" based on the solid components of the liquid light-sensitive resin composition, "the resulting liquid light-sensitive resin composition suffers from some problems such as the precipitation of crystals or insufficient hardening of the lower part."

Appellant argues that there are several flaws in the Examiner's argument.

First, this disclosure in Starkey can only be considered to "**teach away**" from any values

In re the application of: **HAYASHI, Noriya**
Serial Number: **09/664,332**
Reply Brief in response to Examiner's Answer of December 21, 2005

above 4 parts. It is not clear how this can have any bearing on Appellant's arguments regarding the portion of the range from 4 to 6.0 parts.

Secondly, the problems encountered by Starkey do not necessarily apply to the compositions of the present invention, since Starkey's specific compositions **are quite different** from those of the present invention.

Thirdly, it is quite possible that, in fact, the "insufficient hardening of the lower part" problem reported by Starkey is **the very problem solved by the "unexpected results" of the present invention.** As discussed extensively, the "unexpected effect" is that "resin can be cured at a depth where no light reaches" (Declaration of May 12, 2004, page 2). That is, Starkey experiences this problem because the limitations of the present claims **are not met** in Starkey. This is completely consistent with Appellant's argument that the results of the present invention are "unexpected" over the prior art.

Finally, the Examiner's argument in this paragraph focuses only on one claim limitation, that of the last clause of claim 1. As discussed in the Appeal brief (as summarized on page 25), what is at issue is the **synergy between the two limitations of the last two clauses of claim 1.** The Examiner has not addressed this synergy.

On page 14, second paragraph, the Examiner states that: "the experimentation with the sole species of general formula (IV) does not confirm the criticality of the structurally diverse naphthylmethyl-containing sulfonium salt of claim [sic] (IV)." In response, Appellant notes that the Declaration filed March 3, 2003, discussed the importance of using a salt of formula (IV), (IV') or (V).

In re the application of: **HAYASHI, Noriya**
Serial Number: **09/664,332**
Reply Brief in response to Examiner's Answer of December 21, 2005

It would have been impractical to provide data for a large number of examples of each of the components, and Appellant submits that this is not necessary to make the “unexpected results” argument. Clearly, based on the data in the specification and the Declaration of March 3, 2003, the observed effect is not unique to the exemplary compound.

Similarly, on page 14, third paragraph, the Examiner notes the wide range of photopolymerizable resin components that can be used. In response, Appellant notes that the Examples in the specification demonstrate the invention with several different resins, and it would be impractical to provide data testing all of the different possible resin components. Appellant again submits that the Declarations have adequately demonstrated the “unexpected results” associated with the combination of the limitations of the last two clauses of claim 1.

On page 15, the Examiner discusses the specifics of Added Examples 1 and 2, commenting on the use of a single kind of acid anhydride. The Examiner makes similar comments are made regarding the combination of resin and acid anhydride. Again, Appellant argues that it is impossible to present evidence on all of the permutations of the claims, but that the Declarations do demonstrate unexpected results commensurate with the claim limitations.

On page 16, the Examiner comments on Figure A in Declaration II (May 12, 2004). The Examiner states:

“However, these figures are general depictions of the concept of chain curing. There is no association between the results illustrated in the figures and Comparative Examples 2 and 3 of the specification along with Added Examples 1 and 2 referred to on pages 4-5 of the declaration.”

In response, although Appellant did not indicate the specific composition of the examples in Figure A

In re the application of: **HAYASHI, Noriya**
Serial Number: **09/664,332**
Reply Brief in response to Examiner's Answer of December 21, 2005

of Declaration II, Appellant notes that Figure A does represent a comparison of an example of the invention to a reference, non-inventive example, and was presented to illustrate the nature of the observed chain curing effect, in particular, how the effect occurs at upper, middle and lower positions.

On page 16, second paragraph, the Examiner addresses Declaration III (December 27, 2004), commenting that the parameter values in the comparative examples are well above and below the claim limitation, and that Added Example I provides only one value within the claim limitation. In response, Appellant again notes that the point of Declaration III is that it is the simultaneous meeting of two claim limitations that produces the “chain curing” effect, and that this effect **is not seen at all** in the prior art.

On page 17, last paragraph, the Examiner again refers to the molar ratio of 0.93 in Buchwalter's Example 1. Again, Appellant emphasizes that the point of Declaration III is not the exact values of the individual upper and lower limits of the ranges in the limitations, but rather the completely unexpected “chain curing” effect which arises from simultaneously meeting both claim limitations. Appellant submits that the Declarations have clearly demonstrated that this effect does occur with the present invention, and this effect is clearly not disclosed or suggested in any of the cited prior art.

To summarize, Appellant has presented arguments both that no *prima facie* case of obviousness can be made based on the cited references, and that the present claims provide unexpected results over the cited references. The Examiner's remarks in the Examiner's Answer do not contradict Appellant's arguments made in the Appeal Brief. Again, Appellant maintains the arguments made in the Appeal Brief, and respectfully requests withdrawal of the rejection.

In re the application of: **HAYASHI, Noriya**
Serial Number: **09/664,332**
Reply Brief in response to Examiner's Answer of December 21, 2005

Regarding the Attachments

The Examiner has attached a PTO-892 form to the Examiner's Answer, citing four Chemical Abstracts documents. These documents show the chemical structures of some of the sulfonium compounds used in the references. Appellant does not dispute that the references show these compounds, and Appellant submits that these attachments do not contribute any new support for the Examiner's arguments.

Respectfully submitted,

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